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### Special Article - Saving, borrowing, investment and wealth

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#### INTRODUCTION

Australia's net saving relative to GDP has declined from an annual average of approximately 9% in the 1960s to less than 2% in the 1990s. This trend has also been occurring in the United States of America, the United Kingdom and many other developed countries. Net saving is a key economic aggregate as it is the primary means by which the real wealth of the nation increases over time.

Saving, investment, borrowing and lending, change in net worth and net worth (wealth) itself for the nation as a whole and for each institutional sector are all linked by a series of accounting identities in the system of national accounts. These relationships are also important in a balance of payments context.

The main purpose of this article is to draw out these relationships using data from the publication, **Australian System of National Accounts (ASNA)** (Cat. no. 5204.0). In order to do this, it is necessary to draw on the national income, capital and financial accounts and the national and sector balance sheets. The paper also considers some issues related to the definition of saving, as this can affect both the level of measured saving and the trend over time.

The first section discusses the concepts and frameworks used to measure saving, borrowing and lending, and investment. The second section examines limitations with the national accounts measure of saving and develops various adjustments which may be used in economic analysis. It also presents change in net worth as an alternative to saving for certain types of analyses.

#### WHAT IS SAVING?

At its simplest, the magnitude of saving shows by how much an economy's current expenditure is within its current income.

The **System of National Accounts, 1993 (SNA93)** (paragraph 9.19) states that:

'Saving represents that part of disposable income that is not spent on final consumption goods and services. It may be positive or negative depending on whether disposable income exceeds final consumption expenditure, or vice versa.'

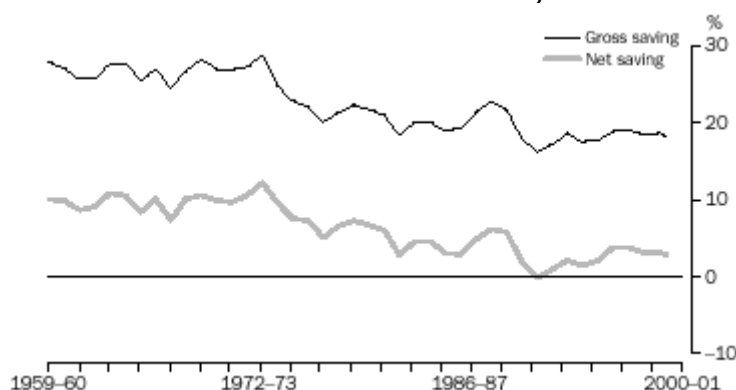
Saving is not a directly measurable variable. It is calculated for the economy and for each sector as a residual item by deducting current expenditures from current disposable income. Therefore, measured saving is dependent on the definitions of income and final consumption expenditure used. For example, the national accounts concept of income excludes the holding gains or losses

which occur from owning assets. This issue will be discussed later in this article.

Two concepts of saving are used-gross and net. Gross saving represents the resources available for investment, including capital replacement. Net saving is derived after deducting consumption of fixed capital from gross saving, and is a measure of what is available for capital formation over and above that required for capital replacement. The net concept is more relevant for the analysis of sustainability and change in wealth.

The following graph shows a comparison of gross and net saving relative to GDP. While holding relatively steady over the 1960s through to the mid 1970s, both measures showed a declining trend through to the early 1990s with some pick up evident since then.

**GROSS AND NET NATIONAL SAVING, relative to GDP**



The gap between gross and net saving represents consumption of fixed capital, which is the decline in the value of fixed assets over the accounting period due to wear and tear, and foreseen obsolescence. The proportion of consumption of fixed capital to gross saving has increased from an average of 64% in the 1960s to 88% over the last ten years. This means that proportionately less of our saving is going towards increasing net worth and more to replacing the existing capital stock. This is partly the consequence of the increase in capital stock over time.

## DERIVATION OF SAVING, INVESTMENT AND NET LENDING

Using data in the ASNA, the following table shows the derivation of national saving.

DERIVATION OF NATIONAL SAVING	
	2000-01 \$m
Compensation of employees	322,638
Gross operating surplus	206,349
Gross mixed income	58,292
Taxes less subsidies on production and imports	82,788
Net primary income from non-residents(a)	-19,751
Gross national income	650,496
Current taxes on income, wealth, etc.	1,113
Other current transfers(b)	-935
Gross disposable income	650,674
Total final consumption expenditure	527,874
<b>Gross saving(c)</b>	<b>122,800</b>

Consumption of fixed capital	104,292
<b>Net saving(c)</b>	<b>18,508</b>

(a) Includes mainly property income flows.

(b) Includes non-life insurance premiums, current transfers between other country governments or international organisations and current transfers between residents and non-residents.

(c) Gross and Net saving are derived as balancing items.

One of the main reasons for the interest in the level of saving is that it helps determine the amount of funds available for further investment so that the economy can maintain or increase its potential for growth. The capital account provides the link between saving and investment.

The capital account records the net acquisition of gross fixed capital; non-produced, non-financial assets; and changes in inventories. It also shows the means by which these additions are financed, namely gross saving, net capital transfers and net lending or borrowing. Statistical discrepancies also arise due to differences between the income-based and expenditure-based measures of GDP. By convention this statistical discrepancy is shown in the capital account in order to achieve accounting balance in the system. The discrepancies do not exist in the years for which the accounts are balanced via supply and use tables, namely the years 1994-95 to 1999-2000.

<b>THE FINANCING OF CAPITAL ACCUMULATION</b>	
	<b>2000- 01 \$m</b>
<b>Total capital accumulation</b>	<b>141,720</b>
Financed by	
Total net saving	18,508
Consumption of fixed capital	104,292
Net capital transfers(a)	1,182
Statistical discrepancy(b)	127
Net borrowing from non-residents	17,611

(a) Capital transfers from ROW less capital transfers to ROW.

(b) Statistical discrepancy (E) less statistical discrepancy (I).

Ignoring the relatively minor capital transfers item, it is clear that if there is a shortfall in national saving, the difference has to be made up by borrowing from non-residents. If there is an excess of saving over that required for investment, the nation becomes a net lender to non-residents.

Net lending or borrowing from non-residents shown in the national capital account is the same as that shown in the external capital account (with the opposite sign). It is also consistent with the sum of the balance on current account and the balance on capital account shown in the balance of payments.

Net lending or borrowing can also be viewed in another way-as the net result of financial transactions. The 'change in financial position' is recorded in the financial accounts. The financial accounts record details of transactions in financial assets and liabilities between Australia and the rest of the world and between resident sectors. It is the final account in the sequence of transaction accounts in the national accounting system.

Financial transactions are classified into the various types of financial instruments including currency and deposits; bills of exchange; loans and placements and equities. In the national financial account, the transactions recorded are those with the rest of the world. The following

summary data are taken from the national financial account.

<b>CHANGE IN FINANCIAL POSITION</b>	
	<b>2000-01 \$b</b>
Acquisitions of financial assets	49.4
Incurrence of liabilities	65
<b>Change in financial position</b>	<b>-15.6</b>
Net errors and omissions	2
Net lending (+) / net borrowing (-)	-17.6

Conceptually, the capital account's 'net lending/net borrowing' and financial account's 'change in financial position' should be the same, but in practice there are discrepancies due to differences in the source data used and differences in the methods of estimation. The discrepancy is shown as 'net errors and omissions' in the financial account to distinguish it from the discrepancy between the income and expenditure measures of GDP. The 'net errors and omissions' item is relatively small at the national level. However, at the sectoral level it can be quite significant. There are ongoing efforts by the ABS to minimise these differences.

These relationships within the national accounting framework make it possible to derive a measure of net saving by an alternative route that starts from the change in financial position in the financial account. This is shown in the next table.

<b>NET SAVING DERIVED FROM FINANCIAL TRANSACTIONS</b>	
	<b>2000-01 \$m</b>
Change in financial position	-15,600
less Consumption of fixed capital	104,292
less Net capital transfers	1,182
plus Gross fixed capital formation	141,247
plus Changes in inventories	366
plus Acquisitions less disposals of non-produced non-financial assets	107
<b>Net saving derived alternatively</b>	<b>20,646</b>

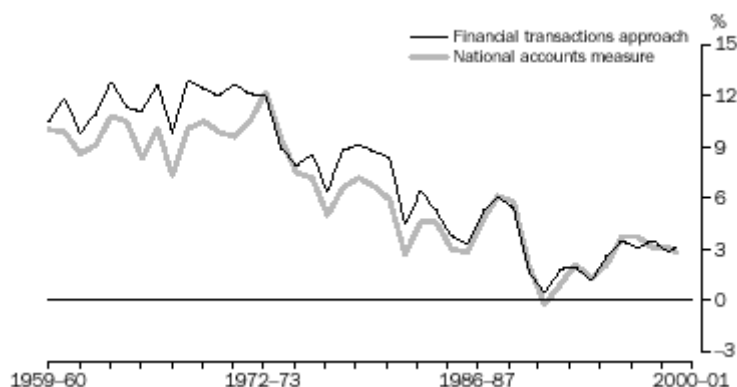
The difference between the two methods for deriving net saving is due to the GDP statistical discrepancy and the net errors and omissions item referred to already. For the years where the GDP measures are balanced using the supply and use tables (i.e. 1994-95 to 1999-2000) the difference is equal to the net errors and omissions item only.

These two measures provide largely independent measures of saving. Errors in the estimates of change in financial position, gross fixed capital formation, capital transfers, changes in inventories and acquisitions less disposals of non-produced non-financial assets will not effect the national accounts measure of saving. On the other hand, errors in the estimates of income or final consumption expenditure do not effect the value of saving derived using the alternative method.

A long term comparison of the two approaches to measuring national net saving is shown in the graph below. Data for change in financial position is taken from the **Balance of Payments and International Investment Position, Australia** (Cat. no. 5363.0) where data on financial

transactions are available for a long time series. The financial transactions approach yields a higher level of national net saving relative to GDP over much of the period from 1959-60 through to the mid 1980s, but since then both series have been quite close. Both series show relatively stable levels of saving relative to GDP from 1959-60 through to the early 1970s, declining levels through to the early 1990s and a relatively small recovery in levels since then. Some significant differences in year-to-year movements emphasise the need for caution in interpreting short term data for saving. However the comparison provides evidence that the national accounts measure of saving is a quite robust estimate of the longer term trends in national saving.

### COMPARISON OF NET SAVING MEASURES, relative to GDP

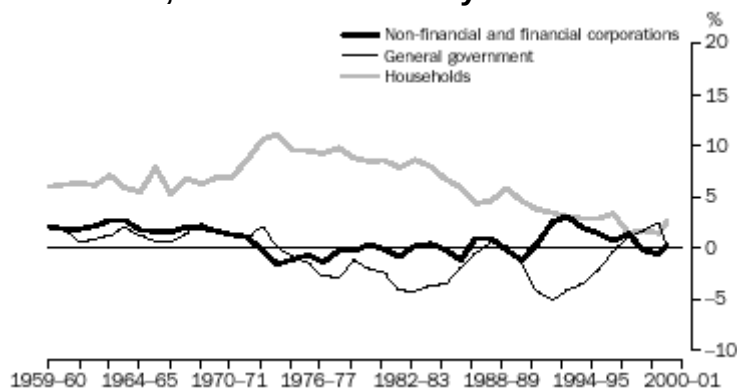


### SAVING BY INSTITUTIONAL SECTOR

So far this article has concentrated on measures of saving, investment and borrowing/lending for the nation as a whole. However, the national accounts also provide a more detailed breakdown into non-financial corporations, financial corporations, general government and households (including unincorporated enterprises). The calculation of these measures for institutional sector transactions are the same as described for the nation. However, components of income are brought into play that more or less consolidate out at the national level (e.g. social security transfers are payments of governments and receipts of households).

It can be seen from the following graph that, over the long term, the household sector has been the main contributor to national saving. The general government sector on the other hand has been a dissaver for much of the period from the 1970s.

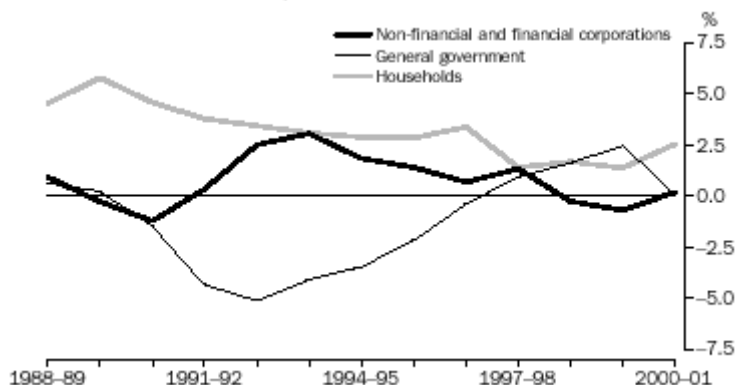
### NET SAVING, relative to GDP - by institutional sector



The next graph focuses on the 1990s. It shows that while net saving of the household sector relative to GDP has declined, this has been more than offset by an increase in government

sector saving (decline in dissaving) and corporate sector saving. Corporate sector saving has been significantly positive for much of the 1990s. This would be consistent with an increasing tendency for corporate profits to be retained, rather than passed on to household shareholders by way of dividends.

### NET SAVING, relative to GDP - by institutional sector - the last decade



### RELATIONSHIP BETWEEN SAVING AND CHANGE IN NET WORTH (WEALTH)

Net worth for Australia (national wealth) is shown in the national balance sheet. It is the difference between the value of Australia's financial and non-financial assets and its liabilities to the rest of the world. The national (and sectoral) balance sheet tables are an integral part of the ASNA.

In 2000-01 the national balance sheet recorded opening net worth of \$2,482.2 billion and closing net worth of \$2,625.2 billion. The difference between these two balances (\$143.0 billion) represents the change in net worth, the composition of which is shown in the following table.

CHANGE IN NET WORTH	
	2000-01 \$b
Opening net worth	2,482.2
Net capital formation	37.7
Financial transactions	-15.6
Other changes in volume	6.9
Revaluations	114.1
Closing net worth	2,625.2
<b>Change in net worth</b>	<b>143</b>

Net capital formation is the net addition to the capital stock after allowing for the consumption of fixed capital. Other changes in volume refers mainly to additions less depletions in natural resource stocks. Revaluations, which is the main contributor to the change in net worth in 2001, reflect the impact of price changes on asset values. Using data item relationships in the capital and financial accounts, an alternative decomposition of change in net worth is possible, which is shown in the following table. It highlights the importance of net saving as a determinant of the real change in net worth, which is the change in net worth abstracting from price changes.

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importance of net saving as a determinant of the real change in net worth, which is the change in net worth abstracting from price changes.

<b>CHANGE IN NET WORTH, alternative decomposition</b>	
	<b>2000-01 \$b</b>
Revaluations	114.1
Net saving	18.5
Capital transfers	1.2
Other changes in volume	6.9
Net errors and omissions	2
Statistical discrepancy	-0.1
<b>Change in net worth</b>	<b>143</b>

## **LIMITATIONS AND ALTERNATIVE CONCEPTS OF SAVING**

Because of the residual nature of the saving estimates, their quality is particularly subject to any errors in the disposable income, final consumption expenditure and consumption of fixed capital aggregates from which they are derived. Also, the measurement of saving is sensitive to the particular concepts of disposable income and consumption in the national accounts. Alternative concepts may be more appropriate for certain types of analyses.

Saving is estimated as the difference between two very large aggregates - income and consumption - each of which will contain errors and omissions in practice. This means that even slight inaccuracies in the estimation of these aggregates can have a large impact on estimates of saving. For example, in 2000-01 total gross disposable income was \$651 billion, total final consumption expenditure was \$528 billion and total net saving was \$19 billion. If final consumption expenditure was incorrect by 1% it would have a 29% impact on the value of measured net saving.

For the same reason, saving estimates can be subject to significant revision, especially for the latest two years and particularly the latest quarter. Estimates for the latest quarter should be used with particular caution. The size and volatility of the statistical discrepancy is a partial indicator of the quality of the saving measure to the extent that it reflects inconsistencies in the measurement of income and final consumption expenditure.

Despite these problems, a previous graph indicated that the measure of national saving in the national income accounts is a fairly robust measure of medium to longer term trends, although there is some uncertainty surrounding year to year movements. Also, problems with measuring national saving tend to be exacerbated at the sectoral level.

The concept of disposable income is directly linked to the measurement of production in the economy - the headline measure being GDP. Disposable income can be generated either directly by participating in the process of production or indirectly through the redistributive process (taxation, social security benefits, income flows with the rest of the world). Holding gains and losses are excluded from the national accounts income measure as they result from price change, not from production.

For some purposes it may be preferable to use a broader definition of income. The definition which has gained currency in economics is that of J. R. Hicks:

'From a theoretical point of view, income is often defined as the maximum amount that a

household, or other unit, can consume without reducing its real net worth.' (SNA93, paragraph 8.15)

This wider definition brings the balance sheet into the measurement of income and saving in order to take account of certain changes in the volume and value of capital during the accounting period. This includes the depletion and discoveries of natural resources, unforeseen losses due to natural disasters, and asset revaluations due to price changes. The measure of saving could also be adjusted to incorporate real interest flows so as to take account of the implicit change in value of nominally denominated assets and liabilities as a result of inflation. Adjustments are made for these factors in the sections below.

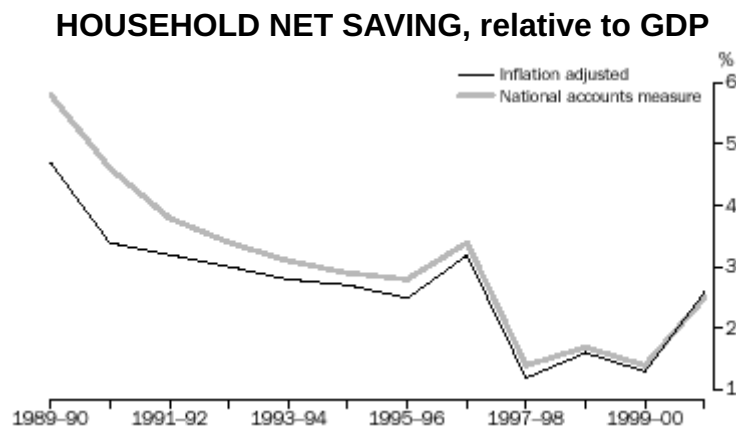
## SAVING ADJUSTED FOR REAL INTEREST FLOWS

Disposable income in the national accounts includes interest earned on financial assets less interest paid on liabilities after deducting the net amount of charges for financial intermediation services indirectly measured (FISIM). Part of the nominal interest received or paid can be regarded as compensation for the loss of purchasing power of the monetary value of the principal which is deposited or borrowed (referred to here as neutral interest). It has been argued that it is only real interest (nominal interest less neutral interest) received and paid that should be included in disposable income.

In a time of high inflation the real level of saving of the asset holder will be overstated. The opposite is the case for the holder of the liability. Even during periods of relatively low inflation there can still be a significant impact on measured saving, as illustrated in the graph below.

Neutral interest is calculated by taking the average stock of 'interest bearing' financial assets and liabilities and multiplying this by the inflation rate (the household final consumption expenditure implicit price deflator has been used). It includes an estimate for the neutral interest earned on insurance technical reserves but not on unfunded superannuation. Net saving is adjusted by deducting the neutral interest on assets and adding the neutral interest on liabilities.

Removing neutral interest has the effect of reducing household net saving relative to GDP in each of the years, except for the latest year shown in the graph. The gap between the official and inflation adjusted estimates of household net saving was 1.1 percentage point in 1989-90. In the latest year inflation adjusted saving was actually higher than the national accounts measure. The adjusted measure of saving exhibits a slower rate of decline than the official measure.



The main factors that drive the difference between the official and the inflation adjusted estimate



of household saving are the level of inflation and the balance between the level of interest bearing financial assets and liabilities held by households. During the 1990s, there was a rapid growth in household borrowings which was not matched by an equivalent growth in interest bearing financial assets. This, and the lower rates of inflation during the 1990s resulted in a narrowing of the gap.

## SAVING ADJUSTED FOR HOLDING GAINS AND LOSSES

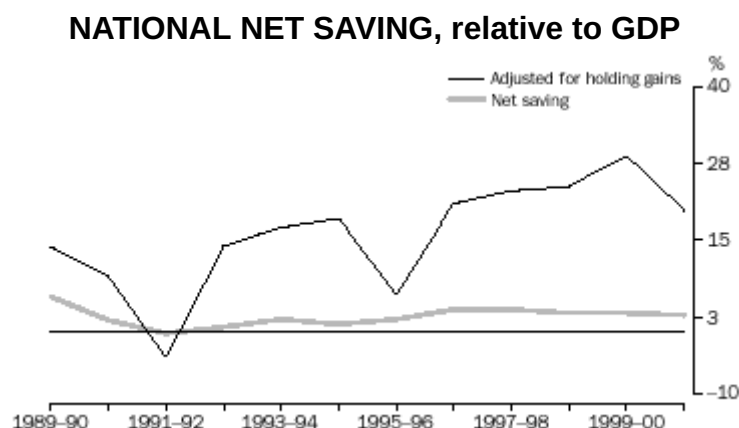
In the national accounting framework, unrealised holding gains/losses are included in the balance sheet when arriving at the value of closing assets and liabilities. They are not included in the income accounts and are therefore excluded from the measure of saving. In theory, they can be split between neutral and real holding gains/losses. The neutral holding gain/loss is that part that is required to maintain the purchasing power of the asset in monetary terms. The real holding gain/loss is what remains after the neutral holding gain/loss is removed. It is the increase in purchasing power accruing to the holder of the asset as a result of its price change relative to changes in the general price level.

SNA93 recognises that real holding gains are an economic variable in their own right and could be taken into account alongside income for the purposes of analysing consumption or capital formation. It goes on to state:

'It can be argued that real holding gains ought to be assimilated with income as defined in the System to obtain a more comprehensive measure of income, but there is no consensus on this. Apart from the practical difficulty of estimating real holding gains and losses, it is likely that their impact on economic behaviour is not the same as that of income received in cash or in kind.' (SNA93, paragraph 12.81)

At present the ASNA balance sheets do not distinguish real and neutral holding gains/losses. However it is possible to use the balance sheet to adjust saving so as to include the whole nominal holding gains/losses.

The following graph shows the effect of adding holding gains and deducting holding losses from national net saving. It results in a volatile series of 'adjusted' net saving, reflecting the volatility of price changes for assets and liabilities. For years other than 1991-92, the holding gains result in increases in net saving. These increases vary depending on the value of the revaluations. For example, the adjustment for revaluations was at a lower level in 1995-96 than for the year before and after. In the case of 1991-92, there was an overall holding loss which was due mainly to a significant devaluation of land.



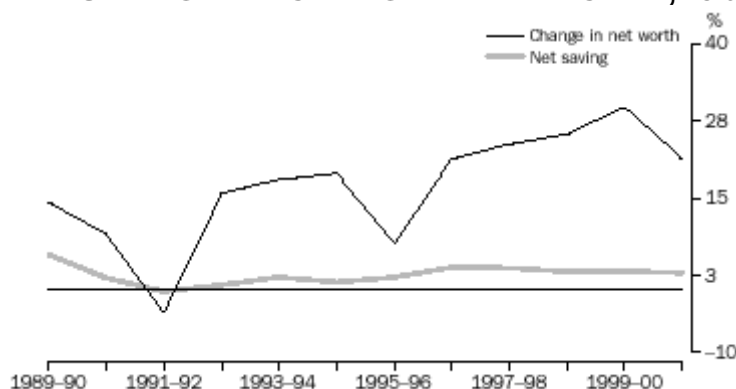
The weakness with this alternative measure is that it includes neutral as well as real holding gains and losses. Even in periods of relatively low inflation, large neutral gains and losses relative to GDP could be expected, as net worth is about four times the value of GDP.

A revaluation account is not currently available for households or other institutional sectors, so an adjustment to household saving for holding gains/losses has not been shown.

## CHANGES IN NET WORTH AS AN ALTERNATIVE TO NET SAVING

The change in national and sector net worth provides a readily available alternative measure to net saving as it not only embodies the adjustment for holding gains/losses shown previously, but also includes other changes in volume of assets (e.g.. the depletion and discovery of natural resources and unforeseen losses). It therefore includes a wider range of resources available for future consumption and investment although asset revaluations still dominate the changes in net worth. It should also be noted that the comments about neutral and real holding gains made in the preceding section apply equally to changes in net worth.

### NATIONAL NET SAVING AND CHANGE IN NET WORTH, relative to GDP



It is often argued that changes in wealth can be an important factor (along with disposable income) in consumption decisions. During the last ten years, the average annual growth rate of household final consumption was 6%, while household disposable income increased on average by 5%. Over this same period, the average annual growth rate of household wealth was 7%. In practice, the linkages between wealth and consumption are likely to be complex and this issue is not pursued further in this article.

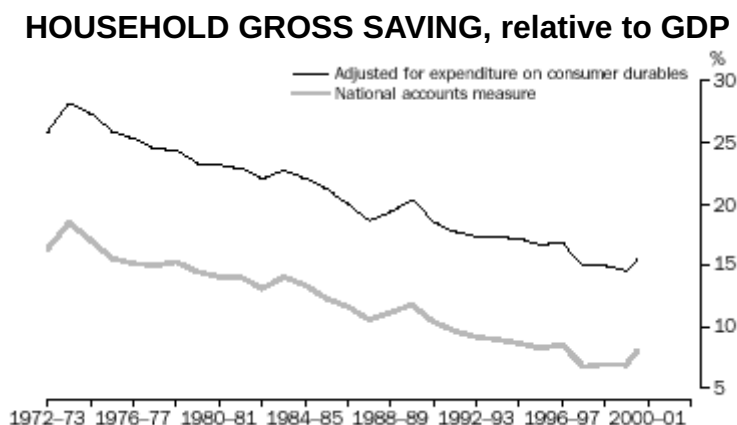
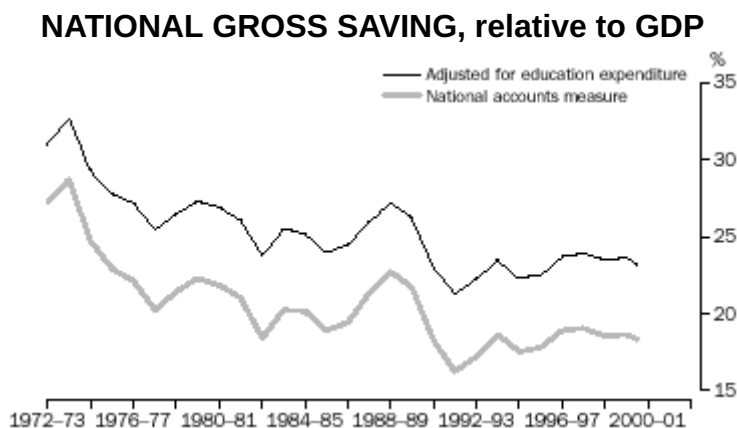
## SAVING ADJUSTED FOR ALTERNATIVE EXPENDITURE CONCEPTS

As for income, in certain circumstances economic theory may postulate some alternative concepts of final consumption expenditure to that used in the national accounts, with consequential impacts on measured saving. Although SNA93 has clear rules on classification, it is recognised that the conceptual dividing line between consumption and investment is not always clear cut.

Some particular examples that have been given include expenditures on education, research and development, certain defence equipment and consumer durables - all of which are treated as consumption expenditure in the national accounts. It could be argued that such expenditure should be treated as investment rather than consumption as it contributes to production into the future. If that view were taken for one or more of these expenditures, measured gross saving

relative to GDP could increase considerably. However, the impact on net saving would not be as significant because consumption of fixed capital would have to be deducted (the value of these assets would have to be written down over time).

The next two graphs illustrate the impacts on gross saving of reclassifying expenditure on education (used as a proxy here for the formation of human capital) and consumer durables from final consumption expenditure to gross fixed capital formation. As estimates of consumption of fixed capital for the additional asset types are unavailable, the impact on net saving cannot be shown.



## CONCLUSION

It can be seen that the relationships between production, income, consumption, saving, investment, borrowing and wealth are integral to the Australian system of national accounts. The relationships underpin the transactions shown in the income accounts, the capital accounts, the financial accounts and the assets and liabilities shown on the balance sheets.

As gross saving is calculated as a residual between two very large aggregates - disposable income and final consumption expenditure - it is sensitive to inaccuracies in the estimates and also to the particular definitions of disposable income and consumption used. Net saving is even more sensitive and this needs to be borne in mind when using the data for analysis.

Saving can be derived through the national income and expenditure accounts or by working backwards from the financial accounts. In theory both approaches should give the same result. However, in practice differences arise at both the national and sectoral levels. There are ongoing efforts to reduce these differences.

Whilst there has been a more than halving of the ratio of national net saving to GDP over the last twenty five years, it is clear that there has been a growth in the value of national and household net worth. Change in net worth is a broader measure of resources available for investment than net saving. Changes in net worth as a ratio to a nominal measure such as GDP may provide a useful alternative measure to saving for certain types of analyses, although for the moment it is not possible to remove the neutral holding gains from the measure. The neutral holding gains compensate asset holders for the impact of inflation on the value of their assets.

The ABS intends to contribute further articles on this topic in future issues of the ASNA.

Comments on this article may be directed to Tony Johnson on 6252 7297, or e-mail **[tony.johnson@abs.gov.au](mailto:tony.johnson@abs.gov.au)**.

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